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EXAMINER

TRUONG, CAM Y T

ART UNIT

PAPER NUMBER

2162

DATE MAILED: 08/26/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/842,495

Applicant(s)

SHANTHAVEERIAIAH ET AL.

Examiner

Cam Y T. Truong

Art Unit

2162

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 June 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15, 23-30, 32-59, 67 and 68 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15, 23-30, 32-59, 67 and 68 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

1. Applicant filled Appeal Brief on 6/13/2005. Applicant's argument has been carefully considered by an appeal conference. Thus, the finality of the office action 2/9/2005 is withdrawn.

Claims 1-15, 23-30, 32-59, 67 and 68 are pending in this Office Action.

Response to Arguments

2. Applicant's arguments with respect to claims 1-15, 23-30, 32-59, 67 and 68 have been considered but are moot in view of the new ground(s) of rejection.

In view of the Appeal Brief filed on 6/13/2005, PROSECUTION IS HEREBY REOPENED. The rejections are set forth below.

To avoid abandonment of the application, appellant must exercise one of the following two options:

(1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37 CFR 1.113 (if this Office action is final); or,

(2) request reinstatement of the appeal.

If reinstatement of the appeal is requested, such request must be accompanied by a supplemental appeal brief, but no new amendments, affidavits (37 CFR 1.130, 1.131 or 1.132) or other evidence are permitted. See 37 CFR 1.193(b)(2).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-9, 12, 14, 43-52, 44, 55, 57, 59, 67, 68 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jantz et al (or hereinafter "Jantz") (USP 6584499) in view of Kidder et al (or hereinafter "Kidder") (US 6880086).

As to claims 1 and 43, Jantz teaches the claimed limitations:

"receiving a list from a fabric driver of fabric devices available to a host system, wherein the fabric driver is part of an operating system for the host system" as providing a list of storage devices available to a user on a window (fig. 6, col. 14, lines 1-30);

"receiving a request to select a subset of the fabric devices from the list" as each management protocol server 828 is queried via an RPC agent thread 826 for its associated device properties. Upon receiving the device properties, DMA 822 builds a device connection table, which gives, for each device, a list of connections into the device. Building a device connection table for each device is represented as creating node (col. 16, lines 13-20);

"wherein each operating system device node provides a mechanism for accessing a corresponding one of the subset of fabric devices through the

operating system executing on the host system" as each user can select subset data of devices as shown in figs 6&7.

Jantz does not explicitly teach the claimed limitation " requesting the fabric driver, to create an operating system device node in the host system for each of the fabric devices in the subset not already online".

Kidder teaches the network manager configured one new network device off-line. A network manager may configure many new device off-line. For example, a network manager may be expecting of five or more new network devices. Referring to Fig. 6o, a network manager may select an off-line device e.g., 192.168.201 by pressing and holding the left mouse button down, dragging an icon over to a newly added device and dropping an icon the newly added by releasing the left mouse button. The NMS client notifies the NMS server to copy the configuration data from the NMS database associated with the first network device e.g., 192.169.201 to a new NMS database associated with the new network device and to change the data in the new NMS database to correspond to the new network device. The network manager then selects the new network device and modify any of the configuration data (col. 36, lines 38-40).

It would have been obvious to a person of an ordinary skill in the art at the time the invention was made to apply Kidder's teaching of creating a node for off-line device to Jantz's system in order to re-configure an operational device in off-line mode without affecting the operation of the network device, provide for reliability, availability and serviceability features, all on an intelligent, purpose-

built platform so that a user can access off-line device easily and further maintain or access storage devices via network system easily and save time for accessing storage devices.

As to claims 2 and 45, Jantz teaches the claimed limitation “prior to said receiving a request to select a subset of the fabric devices from the list: displaying the list of fabric devices available to the host system” as displaying a list of storage devices to the host system (fig. 6).

As to claims 3 and 46, Jantz teaches the claimed limitation “prior to said receiving a list: requesting the fabric driver to provide the list of fabric devices available to the host system in response to user input” as displaying storage devices to user (fig. 6, col. 13, lines 15-50).

As to claims 4 and 47, Jantz teaches the claimed limitations:

“providing a list of fabric devices available to a host system” as providing a list of storage devices available to a user (fig. 6, col. 14, lines 1-30);

“receiving a request to create operating system device nodes in the host system for each fabric device in a selected subset of the fabric devices available to the host system” as each management protocol server 828 is queried via an RPC agent thread 826 for its associated device properties. Upon receiving the device properties, DMA 822 builds a device connection table, which gives, for

each device, a list of connections into the device. Building a device connection table for each device is represented as creating node (col. 16, lines 13-20);

“wherein each operating system device node provides a mechanism for accessing a corresponding one of the subset of fabric devices through the operating system executing on the host system” as each user can select subset data of devices as shown in figs 6&7.

Jantz does not explicitly teach the claimed limitation “creating an operating system device node in the host system for each of the fabric devices in the selected subset not already online”.

Kidder teaches the network manager configured one new network device off-line. A network manager may configure many new device off-line. For example, a network manager may be expecting of five or more new network devices. Referring to Fig. 6o, a network manager may select an off-line device e.g., 192.168.201 by pressing and holding the left mouse button down, dragging an icon over to a newly added device and dropping an icon the newly added by releasing the left mouse button. The NMS client notifies the NMS server to copy the configuration data from the NMS database associated with the first network device e.g., 192.169.201 to a new NMS database associated with the new network device and to change the data in the new NMS database to correspond to the new network device. The network manager then selects the new network device and modify any of the configuration data (col. 36, lines 38-40).

It would have been obvious to a person of an ordinary skill in the art at the time the invention was made to apply Kidder's teaching of creating a node for off-line device to Jantz's system in order to re-configure an operational device in off-line mode without affecting the operation of the network device, provide for reliability, availability and serviceability features, all on an intelligent, purpose-built platform so that a user can access off-line device easily and further maintain or access storage devices via network system easily and save time for accessing storage devices.

As to claims 5 and 48, Jantz teaches the claimed limitations:

"prior to said providing a list of fabric devices: querying a fabric nameserver for information about the fabric devices" as (fig. 8, col. 14, lines 50-67);

"receiving the information about the fabric devices from the nameserver" as (col. 15, lines 20-40);

"and compiling the list of fabric devices available to the host system" as (col. 16, lines 5-20).

As to claims 6 and 49, Jantz teaches the claimed limitation "from the information about the fabric devices, selecting the fabric devices supporting one protocol out of a plurality of protocols supported on the fabric; and compiling the

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list of fabric devices to list only those fabric devices supporting said one protocol”
as (col. 15, lines 50-67; col. 16, lines 1-20)

As to claims 7 and 50, Jantz teaches the claimed limitation “wherein said one protocol is SCSI over Fibre Channel” as (fig. 1, col. 5, lines 35-38).

As to claims 8 and 51, Jantz teaches the claimed limitation “ wherein the list comprises address information to address the fabric devices through the fabric” as (fig. 8, col. 14, lines 50-67; col. 15, lines 1-5).

As to claims 9 and 52, Jantz teaches the claimed limitations:

“receiving a request to identify devices attached to the storage network which are available to a host system” upon locating a server, discover-monitor applet 822 requests from the server a list of all storage controllers or devices it has associated with it. After locating all the devices on the network to be managed, DMA 822 starts a monitor thread 824 for each device. The above information indicates that the system has received the request before identifying devices for monitoring (col. 15, lines 55-60);

“requesting the storage network to identify devices attached to the storage network which are available to the host system” a user may utilize DMA 822 to discover each managed device connected to network (col. 15, lines 45-50);

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receiving a list of the identified devices” as detailed information window 604 preferably presents the detailed properties for each device in the management domain, based upon the particular node a user selects (col. 13, lines 40-55);

“receiving a request to on-line a subset of the identified devices” as when a user select a specific device node in a subtree containing devices, the device’s associated management interface application program is launched (col. 13, lines 45-55);

“wherein each operating system device node provides a mechanism for accessing a corresponding one of the subset of fabric devices through the operating system executing on the host system” as each user can select subset data of devices as shown in figs 6&7.

Jantz does not explicitly teach the claimed limitation:

“creating an operating system device node within the host system for each of the identified devices in the subset that is not already online”.

Kidder teaches the network manager configured one new network device off-line.

A network manager may configure many new device off-line. For example, a network manager may be expecting of five or more new network devices.

Referring to Fig. 60, a network manager may select an off-line device e.g.,

192.168.201 by pressing and holding the left mouse button down, dragging an icon over to a newly added device and dropping an icon the newly added by releasing the left mouse button.

The NMS client notifies the NMS server to copy

the configuration data from the NMS database associated with the first network device e.g., 192.169.201 to a new NMS database associated with the new network device and to change the data in the new NMS database to correspond to the new network device. The network manager then selects the new network device and modify any of the configuration data (col. 36, lines 38-40).

It would have been obvious to a person of an ordinary skill in the art at the time the invention was made to apply Kidder's teaching of creating a node for off-line device to Jantz's system in order to re-configure an operational device in off-line mode without affecting the operation of the network device, provide for reliability, availability and serviceability features, all on an intelligent, purpose-built platform so that a user can access off-line device easily and further maintain or access storage devices via network system easily and save time for accessing storage devices.

As to claims 12 and 55, Jantz teaches the claimed limitation "for each device successfully brought online for the host system by said creating an operating system device node, updating a persistent repository to indicate which devices are currently online" as (figs. 14-15).

As to claims 14 and 57, Jantz teaches the claimed limitation "in response to a reboot of the host system: reading the persistent repository; and online the

devices indicated by the persistent repository to have been online prior to the reboot” as (col. 14, lines 14-45).

As to claim 44, Jantz teaches the claimed limitation “wherein said receiving a list, said selecting a subset, and said requesting the fabric driver to online the selected subset, are requesting the fabric driver to online the selected subset, are performed through an application executing on the host system” as (col. 14, lines 15-67).

As to claim 59, Jantz teaches the claimed limitation “storage network is part of a storage area network (SAN), wherein the device comprise storage devices” as (col. 14, lines 14-55).

As to claim 67, Jantz teaches the claimed limitations:

“viewing a list of fabric devices available to a host system” as displaying devices available to a user (fig. 7, col. 14, lines 15-20);

“selecting a subset of the fabric devices from the list” as selecting a particular device from the list (col. 14, lines 15-20);

“wherein each fabric device that is online has a corresponding operating system device node that provides a mechanism for accessing a corresponding one of the subset of the identified devices through an operating system executing on the host system” as (figs. 6 & 7).

Jantz does not explicitly teach the claimed limitation "and requesting that each of the fabric devices in the subset be brought online if not already online for use from the host system".

Kidder teaches the network manager configured one new network device off-line. A network manager may configure many new device off-line. For example, a network manager may be expecting of five or more new network devices. Referring to Fig. 6o, a network manager may select an off-line device e.g., 192.168.201 by pressing and holding the left mouse button down, dragging an icon over to a newly added device and dropping an icon the newly added by releasing the left mouse button. The NMS client notifies the NMS server to copy the configuration data from the NMS database associated with the first network device e.g., 192.169.201 to a new NMS database associated with the new network device and to change the data in the new NMS database to correspond to the new network device. The network manager then selects the new network device and modify any of the configuration data (col. 36, lines 38-40).

It would have been obvious to a person of an ordinary skill in the art at the time the invention was made to apply Kidder's teaching of creating a node for off-line device to Jantz's system in order to re-configure an operational device in off-line mode without affecting the operation of the network device, provide for reliability, availability and serviceability features, all on an intelligent, purpose-built platform so that a user can access off-line device easily and further maintain

or access storage devices via network system easily and save time for accessing storage devices.

As to claim 68, Jantz teaches the claimed limitation "prior to said viewing a list: requesting the list of fabric devices available to the host system" as (col. 16, lines 5-25).

5. Claims 10-11 and 53-54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jantz in view of Kidder and further in view of Blumenau (or hereinafter "BlumenauA1") (US 20010020254 A1)

As to claims 10 and 53, Jantz and Kidder disclose the claimed limitation subject matter in claims 1 and 43, except the claimed limitation "a fabric, and wherein the host system comprises a plurality of ports to the fabric, wherein said request to identify devices attached to the storage network which are available to a host system is for devices available to the host system through a specified one of the ports, and wherein said requesting the storage network to identify devices is made for the specified port". BlumenauA1 teaches in FIG. 1C, a first port is coupled to a fabric network 30 and a second port is coupled to a loop network 10. For example, a target device is a port on a storage system, after the target device is identified, the HBA will then typically try to determine what other devices (e.g., LUNs) are available behind the identified target device. For example, after HBA 2345a identifies that it can communicate with filter and

adapter unit 2334a, HBA 2345a may send a SCSI INQUIRY command to filter and adapter unit 2334a to determine if there is a LUN0 available that is associated with that target device. Depending on the response to this command, HBA 2345a may then send additional SCSI INQUIRY commands to filter and adapter unit 2334a to determine if other devices are available behind this target device, for example, LUN1, LUN2, etc., up to the maximum number of LUNs (e.g., 256) supported by the HBA. After identifying the target device and any other device that are available behind that target device, the HBA proceeds to identify the next target device in a similar manner (page 19, paragraph [0159]).

It would have been obvious to a person of an ordinary skill in the art at the time the invention was made to apply BlumenauA1's teaching of ports to the fabric, and identifying available devices through a target device as a port to Jantz and Kidder in order to protect data in available devices from unprivileged access and further to avoid conflict when may user access a device at the same time or prevent deadlock.

As to claims 11 and 54, Jantz and Kidder disclose the claimed limitation subject matter in claims 1 and 43, except the claimed limitation "wherein the storage network comprises a fabric, and wherein the host system comprises a plurality of ports to the fabric, wherein said request to identify devices attached to the storage network which are available to a host system is for devices available to the host system through a specified set of the ports, and wherein said

requesting the storage network to identify devices is made for the specified set of the ports". BlumenauA1 teaches in FIG. 1C, a first port is coupled to a fabric network 30 and a second port is coupled to a loop network 10. For example, a target device is a port on a storage system, after the target device is identified, the HBA will then typically try to determine what other devices (e.g., LUNs) are available behind the identified target device. For example, after HBA 2345a identifies that it can communicate with filter and adapter unit 2334a, HBA 2345a may send a SCSI INQUIRY command to filter and adapter unit 2334a to determine if there is a LUN0 available that is associated with that target device. Depending on the response to this command, HBA 2345a may then send additional SCSI INQUIRY commands to filter and adapter unit 2334a to determine if other devices are available behind this target device, for example, LUN1, LUN2, etc., up to the maximum number of LUNs (e.g., 256) supported by the HBA. After identifying the target device and any other device that are available behind that target device, the HBA proceeds to identify the next target device in a similar manner (page 19, paragraph [0159]).

It would have been obvious to a person of an ordinary skill in the art at the time the invention was made to apply BlumenauA1's teaching of ports to the fabric, and identifying available devices through a target device as a port to Jantz and Kidder in order to protect data in available devices from unprivileged access and further to avoid conflict when may user access a device at the same time or prevent deadlock.

6. Claims 13 and 56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jantz et al (or hereinafter "Jantz") (USP 6584499) in view of Kidder and further in view of Carlson et al (or hereinafter "Carlson") (USP 5600791) and Basham et al (or hereinafter "Basham") (USP 6182167).

As to claims 13 and 56, Jantz discloses the claimed limitation subject matter in claims 1 and 43, except the claimed limitation "receiving from the storage network a notification that a device is no longer available; and updating the persistent repository to reflect that the unavailable device is offline". Carlson teaches that receipt of local failure notification message 305, local IOP manager 117 updates its system device table to indicate that optical storage device 135 is unavailable (fig. 6). Basham teaches the SCSI system having offline or status signal which indicates that a device is unavailable or offline (fig. 2).

It would have been obvious to a person of an ordinary skill in the art at the time the invention was made to apply Carlson's teaching of receipt of local failure notification message 305, local IOP manager 117 updates its system device table to indicate that optical storage device 135 is unavailable and Basham's teaching of the SCSI system having offline or status signal which indicates that a device is unavailable or offline to Jantz's system in order to provide for status propagation without the expensive human interventions, and to avoid conflicting service and maintenance efforts and to allow multiple hosts to non-concurrently utilize the same multiport device.

7. Claims 15 and 58 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jantz et al (or hereinafter "Jantz") (USP 6584499) in view of Kidder and further in view of Wieland (USP 6643748).

As to claims 15 and 58, Jantz discloses the claimed limitation subject matter in claims 1 and 43, except the claimed limitation "a Fibre Channel switched fabric comprising a plurality of Fibre Channel switches". Wieland teaches Fibre Channel switches (col. 2, lines 25-35).

It would have been obvious to a person of an ordinary skill in the art at the time the invention was made to apply Wieland's teaching of Fibre Channel switches to Jantz's system in order to connect multiple boosts to the same storage devices and to access storage devices connected to a SAN.

8. Claims 23-25, 28-30 and 40-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Blumenau (US 6665714) in view of Kidder.

As to claim 23, Blumenau teaches the claimed limitations:

"one or more adapter ports for connecting to a fabric, wherein the fabric driver is part of an operating system for the host system" as a first port 0 is coupled to fabric network 10 (col. 6, lines 35-40);

"a fabric driver configured to interface the host system to the fabric" as (fig. 1B, col. 6, lines 15-30);

“an application configured to request the fabric driver to provide a list of fabric devices attached to the fabric that are visible to the host system through one of said adapter ports” as using either one of these interfaces, one can display listings of devices, modify relationships of devices (e.g., assign, revoke, modify privileges on storage volumes for hosts that are connected to the network), etc. Furthermore, with each of these interfaces, one can also modify properties that are associated with network devices (col. 23, lines 60-67; col. 24, lines 1-25);

“wherein the fabric driver is further configured to provide the list of fabric devices to the application in response to the request from the application” as (col. 23, lines 60-67; col. 24, lines 1-25);

“wherein the application is further configured to indicate to the fabric driver a selected subset of the fabric devices from the list to be brought online for access from the host system” as (col. 23, lines 10-45),

“wherein each operating system device node provides a mechanism for accessing a corresponding one of the subset of fabric devices through the operating system executing on the host system” as (fig. 14).

Blumenau does not explicitly teach the claimed limitation “wherein the fabric driver is further configured to online the selected subset of fabric devices so that the selected subset of fabric devices are accessible from the host system; wherein the fabric driver is further configured to create operating system device nodes within the host system for each device of the selected subset”.

Kidder teaches the network manager configured one new network device off-line. A network manager may configure many new device off-line. For example, a network manager may be expecting of five or more new network devices. Referring to Fig. 6o, a network manager may select an off-line device e.g., 192.168.201 by pressing and holding the left mouse button down, dragging an icon over to a newly added device and dropping an icon the newly added by releasing the left mouse button. The NMS client notifies the NMS server to copy the configuration data from the NMS database associated with the first network device e.g., 192.169.201 to a new NMS database associated with the new network device and to change the data in the new NMS database to correspond to the new network device. The network manager then selects the new network device and modify any of the configuration data (col. 36, lines 38-40).

It would have been obvious to a person of an ordinary skill in the art at the time the invention was made to apply Kidder's teaching of creating a node for off-line device to Jantz's system in order to re-configure an operational device in off-line mode without affecting the operation of the network device, provide for reliability, availability and serviceability features, all on an intelligent, purpose-built platform so that a user can access off-line device easily and further maintain or access storage devices via network system easily and save time for accessing storage devices.

As to claim 24, Blumenau teaches the claimed limitation “ wherein the application is further configured to: display the list to a user through a user interface; and provide through the user interface for the user to select devices from the list as the selected subset of the fabric device to be brought online” as (col. 24, lines 10-67).

As to claim 25, Blumenau teaches the claimed limitation “ wherein, in response to the request from the application, the fabric driver is further configured to: query a fabric nameserver for information about the fabric devices to compile the list; wherein the nameserver maintains information identifying devices accessible throughout the fabric” as (col. 17, lines 45-67; co.. 18, lines 1-25).

As to claim 26, Blumenau and Kidder teach the claimed limitation subject matter in claim25, Kidder further teaches the claimed limitation “from the information about the fabric devices, select the fabric devices supporting one protocol out of a plurality of protocols supported on the fabric; and return the list of fabric devices to the application, wherein the list of fabric devices is a list of devices supporting said one protocol” as (figs. 5A).

As to claim 28, Blumenau teaches the claimed limitation "wherein the list comprises address information to address the fabric devices through the fabric" as (figs 1-3).

As to claim 40, Blumenau teaches the claimed limitation "wherein the fabric comprises a Fibre Channel switched fabric comprising a plurality of Fibre Channel switches" as (fig. 3).

As to claim 41, Blumenau teaches the claimed limitation "wherein the fabric is part of a storage area network (SAN), and wherein the fabric devices comprise storage devices" as (col. 7, lines 1-35).

As to claim 32, Blumenau and Kidder discloses the claimed limitation subject matter in claim 23, Kidder further teach the claimed limitation "a plurality of I/O ports including the one or more adapter ports for connecting to a fabric; and a device discovery mechanism configured to: determine whether each of the I/O ports is connected to one or more direct attach devices or to the fabric; for each of the I/O ports connected to one or more direct attach devices, discover the one or more direct attach devices and create an operating system node for accessing each direct attach device; and for each of the I/O ports connected to the fabric, designate the I/O port as a fabric port without attempting to discover the fabric devices" as (fig. 5A)

As to claim 33, Blumenau teaches the claimed limitation “wherein said discovery mechanism is configured to execute in response to a reboot of the host system, and wherein said application is configured to execute on the host system subsequent to said reboot and said discovery process” as (col. 14, lines 20-50).

As to claim 34, Blumenau teaches claimed limitation “wherein each of the I/O ports connected to the fabric comprises a Fibre Channel host adapter port” as (fig. 1).

As to claim 37, Blumenau and Kidder teaches the claimed limitation subject matter in claim 31, Kidder further teaches “a library configured to provide an interface between said application and said fabric driver, wherein the library is configured to update a persistent repository for each fabric device successfully brought online for the host system to indicate which devices are currently online” as (fig. 6o).

9. Claims 29 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Blumenau in view of kidder and further in view of Blumenau (or hereinafter “BlumenauA1”) (US 20010020254 A1)

As to claim 29, Blumenau does not teach the claimed limitation “wherein the application is further configured to make said request to the fabric driver for a specified one of the one or more adapter ports” as (col. 7, lines 1-10).

BlumenauA1 teaches in FIG. 1C, a first port is coupled to a fabric network 30 and a second port is coupled to a loop network 10. For example, a target device is a port on a storage system, after the target device is identified, the HBA will then typically try to determine what other devices (e.g., LUNs) are available behind the identified target device. For example, after HBA 2345a identifies that it can communicate with filter and adapter unit 2334a, HBA 2345a may send a SCSI INQUIRY command to filter and adapter unit 2334a to determine if there is a LUN0 available that is associated with that target device. Depending on the response to this command, HBA 2345a may then send additional SCSI INQUIRY commands to filter and adapter unit 2334a to determine if other devices are available behind this target device, for example, LUN1, LUN2, etc., up to the maximum number of LUNs (e.g., 256) supported by the HBA. After identifying the target device and any other device that are available behind that target device, the HBA proceeds to identify the next target device in a similar manner (page 19, paragraph [0159]).

It would have been obvious to a person of an ordinary skill in the art at the time the invention was made to apply BlumenauA1’s teaching of ports to the fabric, and identifying available devices through a target device as a port to

Blumenau and Kidder in order to protect data in available devices from unprivileged access and further to avoid conflict when may user access a device at the same time or prevent deadlock.

As to claim 30, Blumenau does not explicitly teaches the claimed limitation “wherein the application is further configured to make said request to the fabric driver for a specified set of the one or more adapter ports”.

BlumenauA1 teaches in FIG. 1C, a first port is coupled to a fabric network 30 and a second port is coupled to a loop network 10. For example, a target device is a port on a storage system, after the target device is identified, the HBA will then typically try to determine what other devices (e.g., LUNs) are available behind the identified target device. For example, after HBA 2345a identifies that it can communicate with filter and adapter unit 2334a, HBA 2345a may send a SCSI INQUIRY command to filter and adapter unit 2334a to determine if there is a LUN0 available that is associated with that target device. Depending on the response to this command, HBA 2345a may then send additional SCSI INQUIRY commands to filter and adapter unit 2334a to determine if other devices are available behind this target device, for example, LUN1, LUN2, etc., up to the maximum number of LUNs (e.g., 256) supported by the HBA. After identifying the target device and any other device that are available behind that target device, the HBA proceeds to identify the next target device in a similar manner (page 19, paragraph [0159]).

It would have been obvious to a person of an ordinary skill in the art at the time the invention was made to apply BlumenauA1's teaching of ports to the fabric, and identifying available devices through a target device as a port to Blumenau and Kidder in order to protect data in available devices from unprivileged access and further to avoid conflict when may user access a device at the same time or prevent deadlock.

10. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Blumenau in view of Kidder and further in view of Nolan¹⁴¹ and Sambamurthy et al (or hereinafter "Sambamurthy") (USP 6393489).

As to claim 27, Blumenau discloses the claimed limitation subject matter in claim 23, except the claimed limitation "wherein said one protocol is SCSI over Fibre Cannel". Sambamurthy teaches Fibre Cannel (fig. 9).

It would have been obvious to a person of an ordinary skill in the art at the time the invention was made to apply Sambamurthy's teaching of Fibre Cancel to Blumenau's system in order to allow a user to access storage device via a network system.

11. Claim 42 is rejected under 35 U.S.C. 103(a) as being unpatentable over Blumenau in view of Kidder and further in view of Hoese et al (or hereinafter "Hoese") (US 5941972).

As to claim 42, Blumenau teaches the claimed limitation “a Fibre Channel protocol module configured to perform SCSI protocol operations between the host system and the fabric; and one or more Fibre Channel port drivers configured to perform transport layer operations between the host system and the fabric; wherein the Fibre Channel protocol module and the one or more Fibre Channel port drivers are part of an operating system kernel on the host system”. Hoese teaches SCSI protocol and Fibre channel and an operating system kernel (fig. 5).

It would have been obvious to a person of an ordinary skill in the art at the time the invention was made to apply Hoese’s teaching of SCSI protocol and Fibre channel and an operating system kernel to Blumenau and Kidder in order to provide virtual local storage on remote SCSI storage devices to Fibre Channel devices are disclosed that provide advantages over conventional network storage devices.

12. Claim 35 is rejected under 35 U.S.C. 103(a) as being unpatentable over Blumenau in view of Kidder and further in view of Chow et al (or hereinafter “Chow”) (USP 6594698).

As to claim 35, Blumenau discloses the claimed limitation subject matter in claim 33, except the claimed limitation “wherein each of the I/O ports connected to one or more direct attach devices comprises a port to a Fibre Channel private loop or point-to-point link”. Chow teaches Fibre channel loop (figs. 2-3).

It would have been obvious to a person of an ordinary skill in the art at the time the invention was made to apply Chow's teaching of Fibre Channel loop to Blumenau in order to negotiated between the input/output node and to de-allocating resources requested by the first node to another node.

13. Claims 38-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Blumenau in view of Nolan and further in view of Chow et al (or hereinafter "Chow") (USP 6594698), Carlson and Basham.

As to claim 38, Blumenau discloses the claimed limitation subject matter in claim 37, except the claimed limitation "wherein the library is further configured to: receive from the fabric driver a notification that a fabric device is no longer available; and update the persistent repository to reflect that the unavailable fabric device is offline". Carlson teaches that receipt of local failure notification message 305, local IOP manager 117 updates its system device table to indicate that optical storage device 135 is unavailable (fig. 6). Basham teaches the SCSI system having offline or status signal which indicates that a device is unavailable or offline (fig. 2).

It would have been obvious to a person of an ordinary skill in the art at the time the invention was made to apply Carlson's teaching of receipt of local failure notification message 305, local IOP manager 117 updates its system device table to indicate that optical storage device 135 is unavailable and Basham's

teaching of the SCSI system having offline or status signal which indicates that a device is unavailable or offline to Jantz's system in order to provide for status propagation without the expensive human intervention, and to avoid conflicting service and maintenance efforts and to allow multiple hosts to non-concurrently utilize the same multiport device.

As to claim 39, Blumenau teaches the claimed limitation "wherein the discovery mechanism is further configured to, in response to a reboot of the host system: read the persistent repository; and request the fabric driver to online the devices indicated by the persistent repository to have been online prior to the reboot" as (fig. 3).

Allowable Subject Matter

15. Claim 36 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The prior art of record, alone or in combination, does not teach or fairly suggest the combination of steps as recited in dependent claim 36 "said discovery mechanism is configured to determine whether each of the I/O ports is connected to one or more direct attach devices or to the fabric by attempting to log-in to the fabric through each I/O port; wherein if the log-in fails, said discovery

mechanism is configured to designate the I/O port as a direct-attach port; and if the log-in is successful, designate the I/O port as a fabric port”.

Conclusion

16. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.


Kim (US 6920491).

Contact Information

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cam Y T Truong whose telephone number is (571) 272-4042. The examiner can normally be reached on Monday to Friday. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Breene can be reached on (571) 272-4107. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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